

FERNALD SILOS PROJECT

PROGRESS BRIEFING

April 2002

6:30 p.m.

Opening Remarks

Fernald Citizens Advisory Board

Silos Project Background

Accelerated Schedule

Waste Retrieval

Silos 1 and 2

Silo 3

Question and Answer Session

Gary Stegner

Jim Bierer

Nina Akgunduz

Ray Corradi

Bruce Schweitzer

John North

Doris Edwards

Panel

8:30 p.m. Adjourn

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SILOS PROJECT

Background - 2000

- May - Rocky Mountain Remedial Services began site preparation construction for Silo 3 project
- June - Foster Wheeler Environmental Corporation began site preparation and construction on the Waste Retrieval Transfer Tank Area and Radon Control System Building
- July - Record of Decision (ROD) Amendment signed
- December - DOE awarded site closure contract to Fluor Fernald and teaming partners Jacobs Engineering Group and Duratek

SILOS PROJECT

Background - 2001

- January - Rocky Mountain Remedial Services subcontract terminated
- April - Jacobs Engineering Group begins Silos 1 and 2 conceptual design
- June - Foster Wheeler Environmental Corporation subcontract terminated. Fluor Fernald assumed AWR work with Jacobs Engineering Group as design authority
- June - Began Silo 3 Pre-conceptual design

SILOS PROJECT

Background - 2001 (Cont.)

- July/August - DOE completed the Site Closure Contract (2009)
Baseline Review
- September - Jacobs Engineering Group completed Silos 1 and 2
conceptual design
- December - Fluor Fernald and DOE agreed to 2006 closure
and rebaseline

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SILOS PROJECT

Background - 2002

- January - Fluor Fernald completed Transfer Tank Area concrete work
- January - Jacobs Engineering Group completed Silo 3 conceptual design
- March - Fluor Fernald completed two transfer tanks and the concrete building that will house the Radon Control System
- March/April - DOE in process of reviewing the 2006 Closure Baseline

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ACCELERATED SCHEDULE

Why Accelerate to 2006?

- Reduce public risk
- Reduce occupational exposure
- Improve project efficiency
- Reduce total cost to taxpayers

ACCELERATED SCHEDULE

Ground Rules for Acceleration

- Maintain safety
- Maintain planning
- Do not compromise scope
- Accommodate minor changes by making some design components adaptable
- Build as parts of design become ready

ACCELERATED SCHEDULE

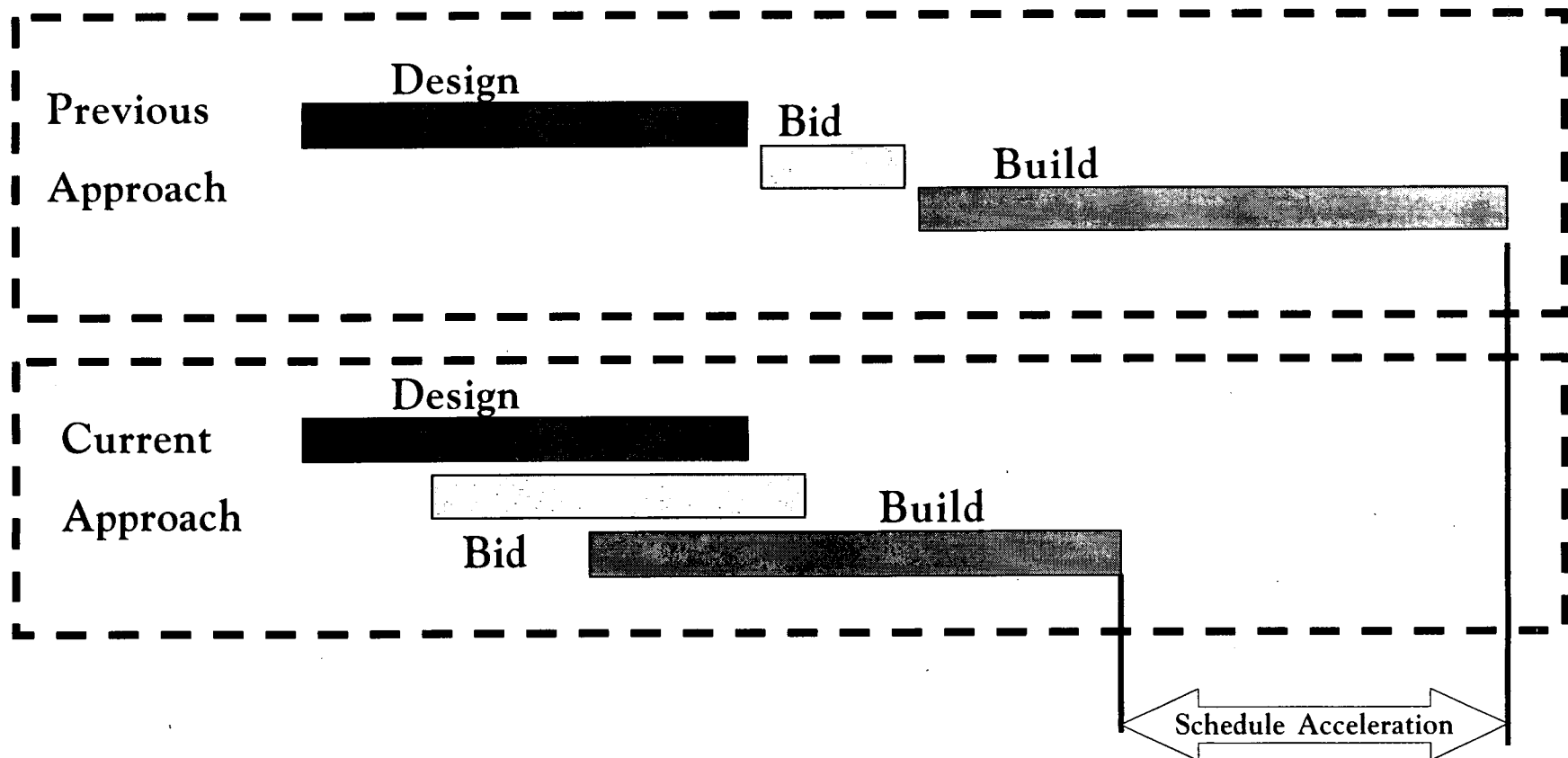
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What Changed in Silos?

- Fluor changed project delivery methods to achieve closure in 2006
- New baseline removed funding constraints
- Implemented a rigorous constructability process with an experienced staff
- Planned to carefully coordinate start of construction with completion of design for each phase

ACCELERATED SCHEDULE

Project Delivery Change



ACCELERATED SCHEDULE

Benefits of Fast Track/Design-Build

- Focuses engineering efforts on construction priorities
- Allows for early identification of issues without cascade effects
- Takes advantage of interactive design and construction involvement
- Decreases material staging space needs
- Offers resource leveling opportunities to meet project priorities
- Allows better quality control for discrete tasks
- Allows for well-planned project acceleration

ACCELERATED SCHEDULE

Risks of Work Package Execution

- To avoid late equipment changes: must get approved information and vendor installation support
- To avoid lack of interface definition: must perform cross-discipline checks and use experienced constructability planners and package owners

WASTE RETRIEVAL

Major Components

- Radon Control System (RCS)
- Bridges over Silos 1 and 2
- Silos 1 and 2 sluicing and slurry pump modules
- Silos Waste Retrieval System pipe rack
- Transfer Tank Area (TTA)

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WASTE RETRIEVAL

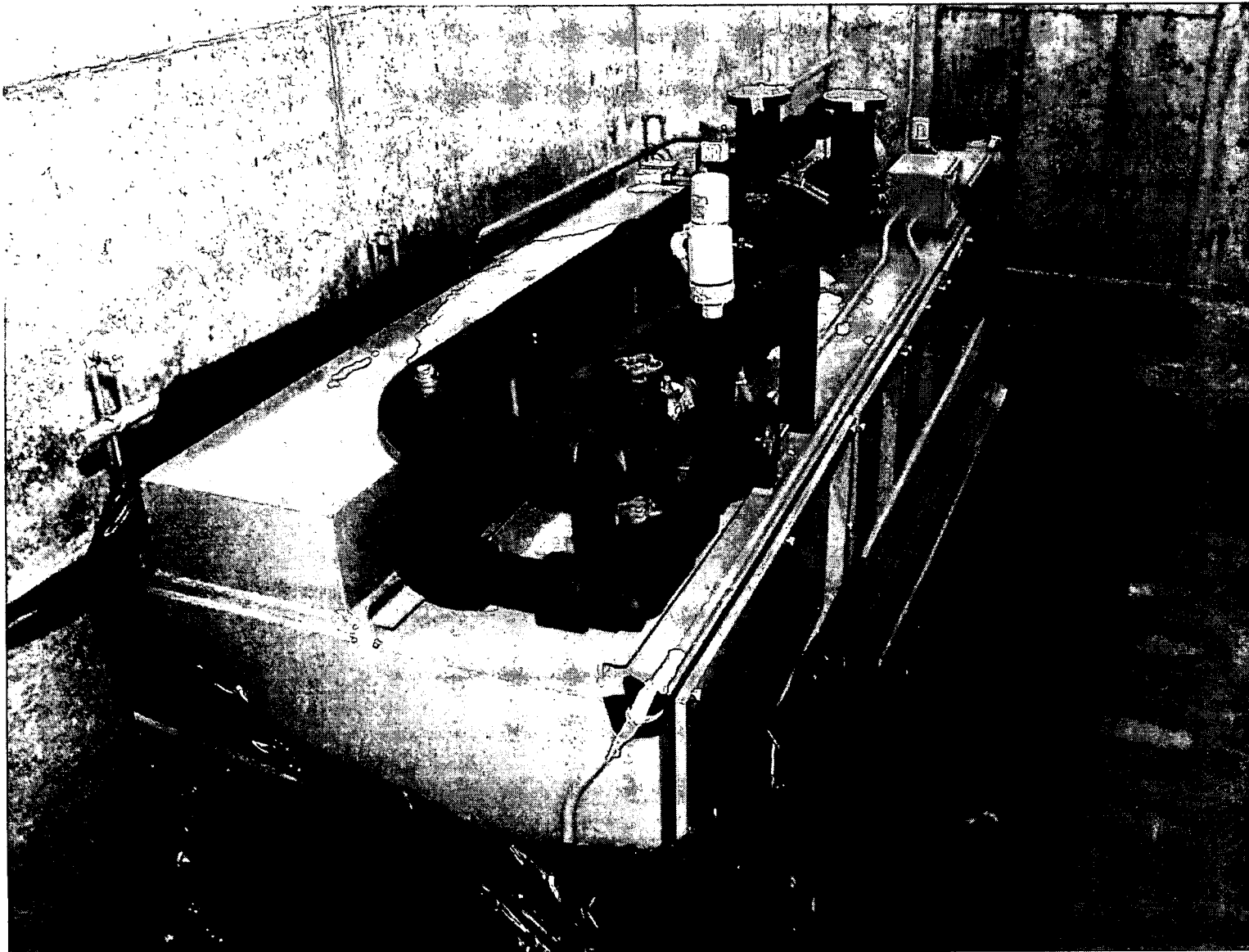
Radon Control System Components

- Fans
- Desiccant dryers
- Carbon beds
- Exhaust stack
- Electrical, mechanical, instrument
and control support systems

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RADON CONTROL SYSTEM DESICCANT DRYER

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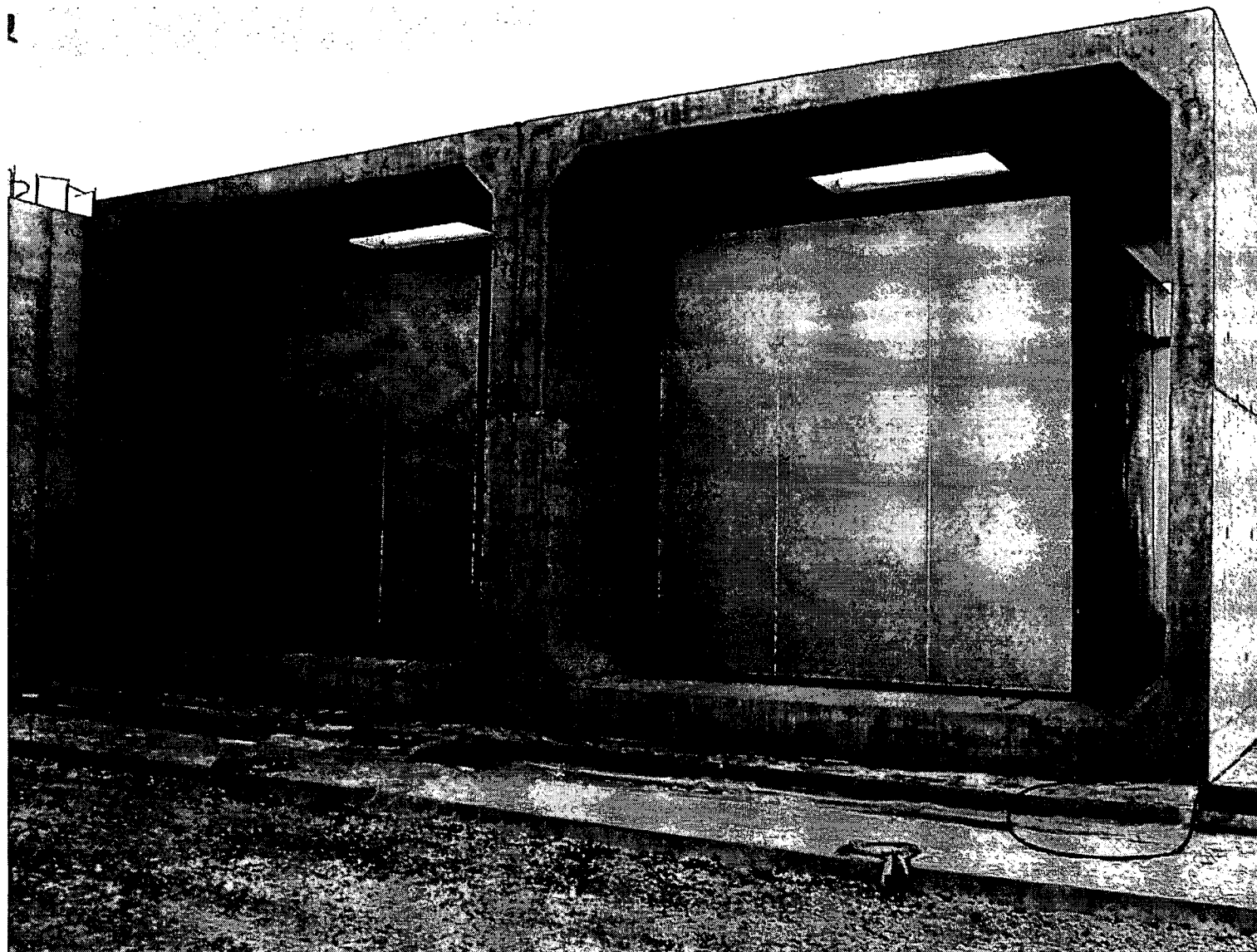


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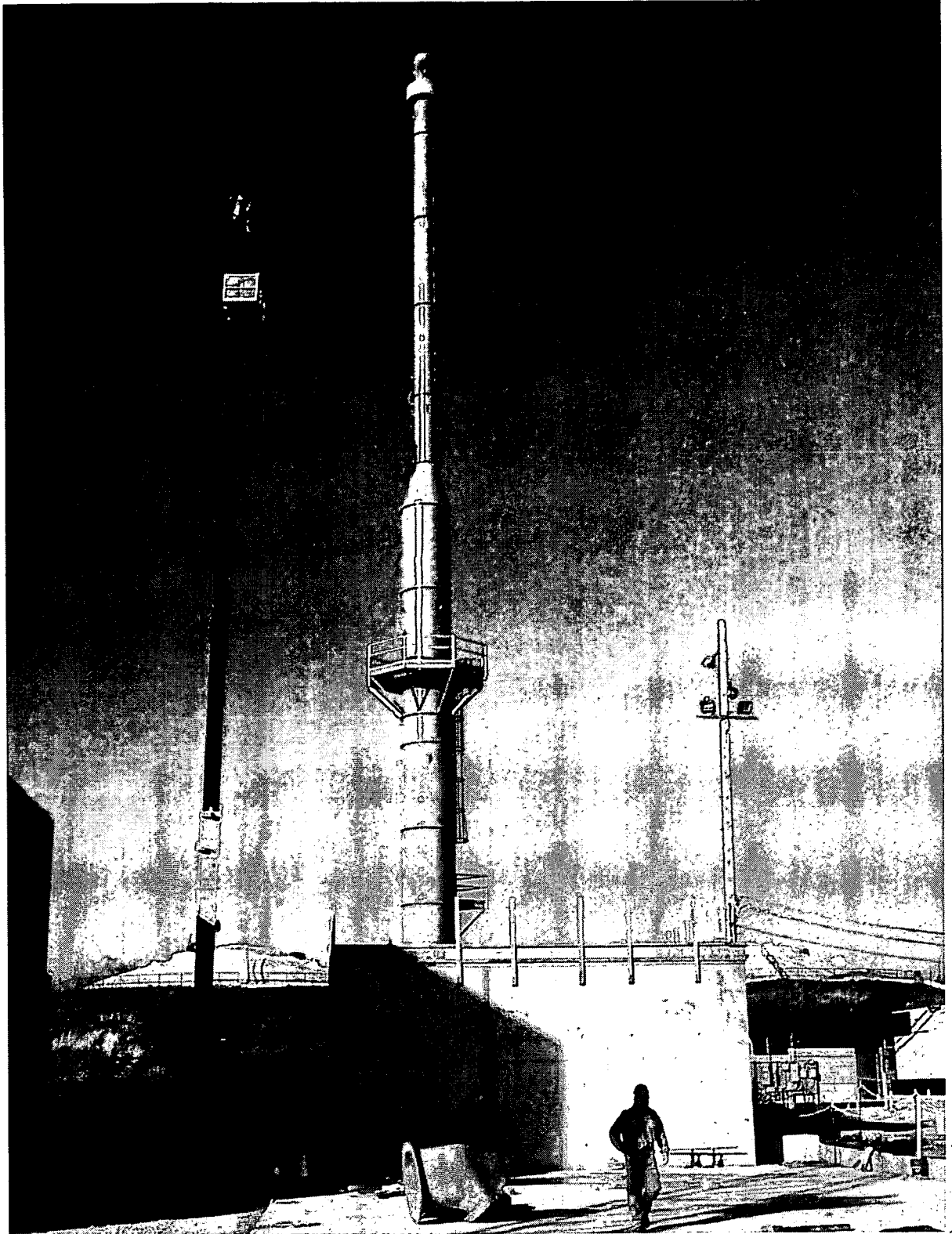
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RADON CONTROL SYSTEM CARBON BEDS



RADON CONTROL SYSTEM CONSTRUCTION

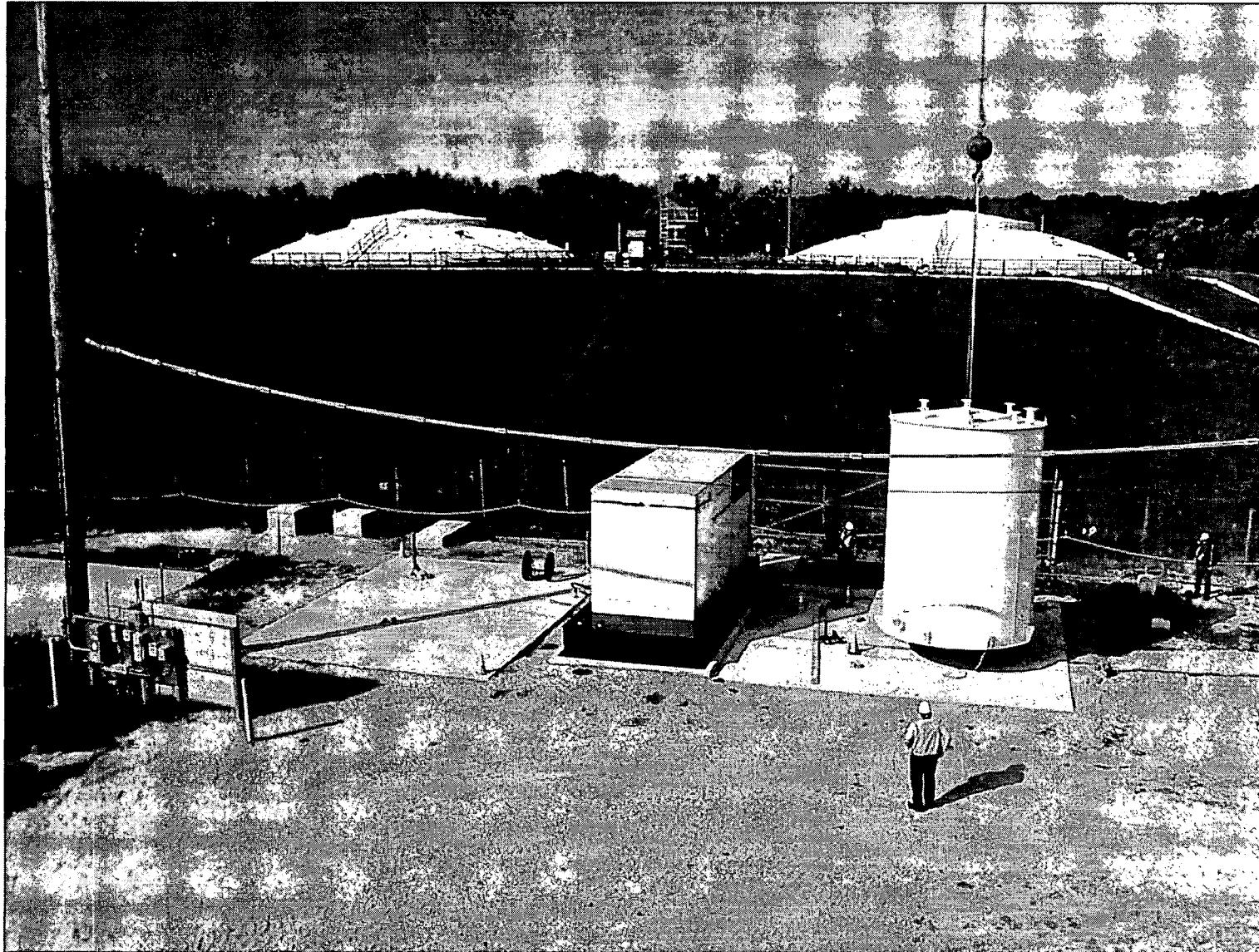


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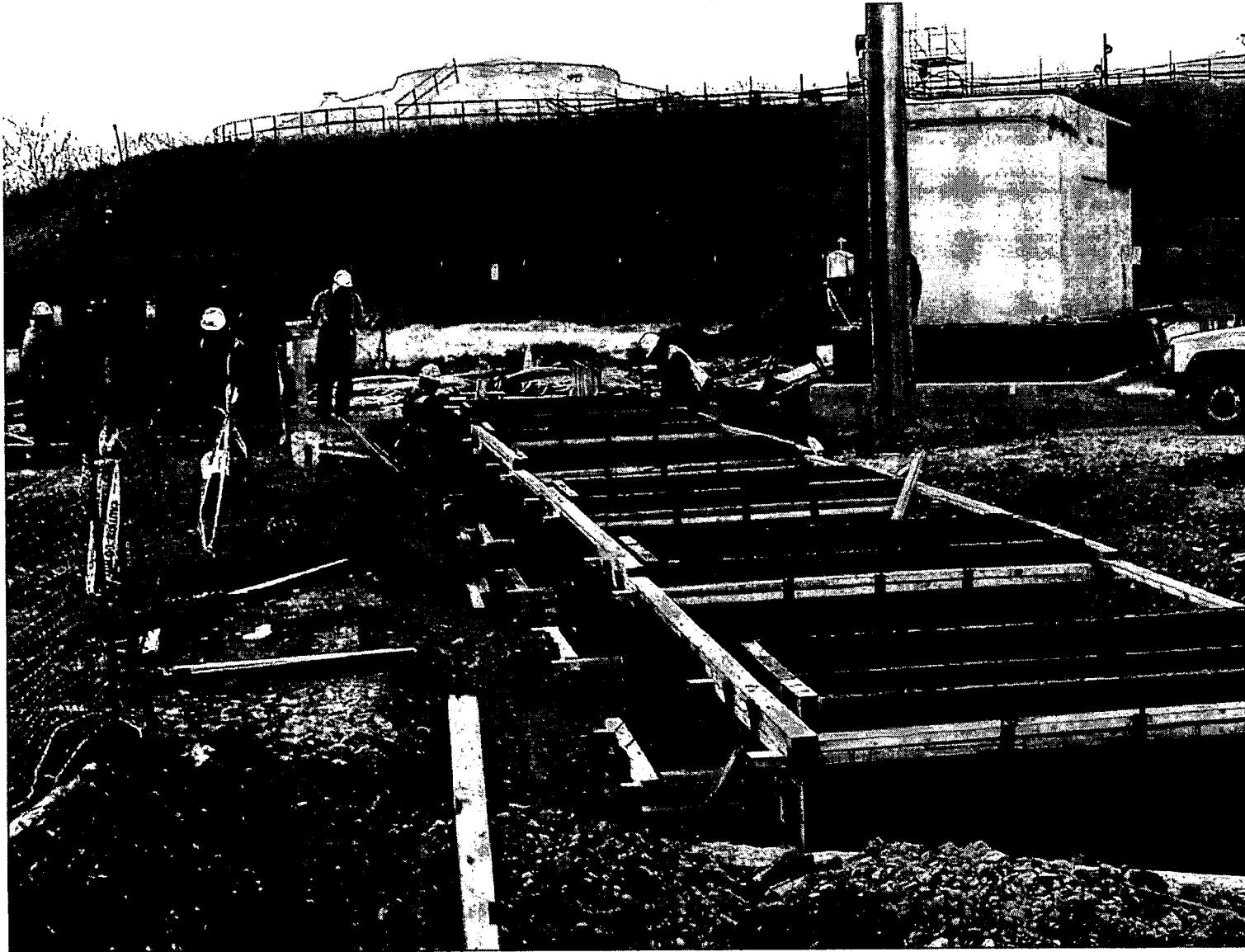
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RADON CONTROL SYSTEM TANK PLACEMENT



FOUNDATIONS FOR CABLE TRAY SUPPORTS

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WASTE RETRIEVAL

How the Radon Control System Works

- Filters air in the silos headspace to remove radon
- Air circulates through two desiccant dryers
- Air then circulates through four carbon beds which adsorb radon
- Air returns to the silos or is vented through the exhaust stack

WASTE RETRIEVAL

Radon Control System Operation

- Phase 1 during bridge construction and material removal components installation
- Phase 2 during material transfer from Silos 1 and 2 to the transfer tanks
- Phase 3 during material treatment

WASTE RETRIEVAL

Radon Control System Statistics

- Operates at up to 2,000 cubic feet per minute
- Will condition air to 40 degrees Fahrenheit
- Will condition air which contains up to 15 percent relative humidity
- Each 1,500-cubic-foot carbon bed contains 45,000 pounds of carbon

WASTE RETRIEVAL

How Waste Retrieval Works

- Bridges over Silos 1 and 2 support sluicing and pump modules
- Sluice jets inside silos mix waste material with water
- Slurry pumps draw material through double containment piping into transfer tanks

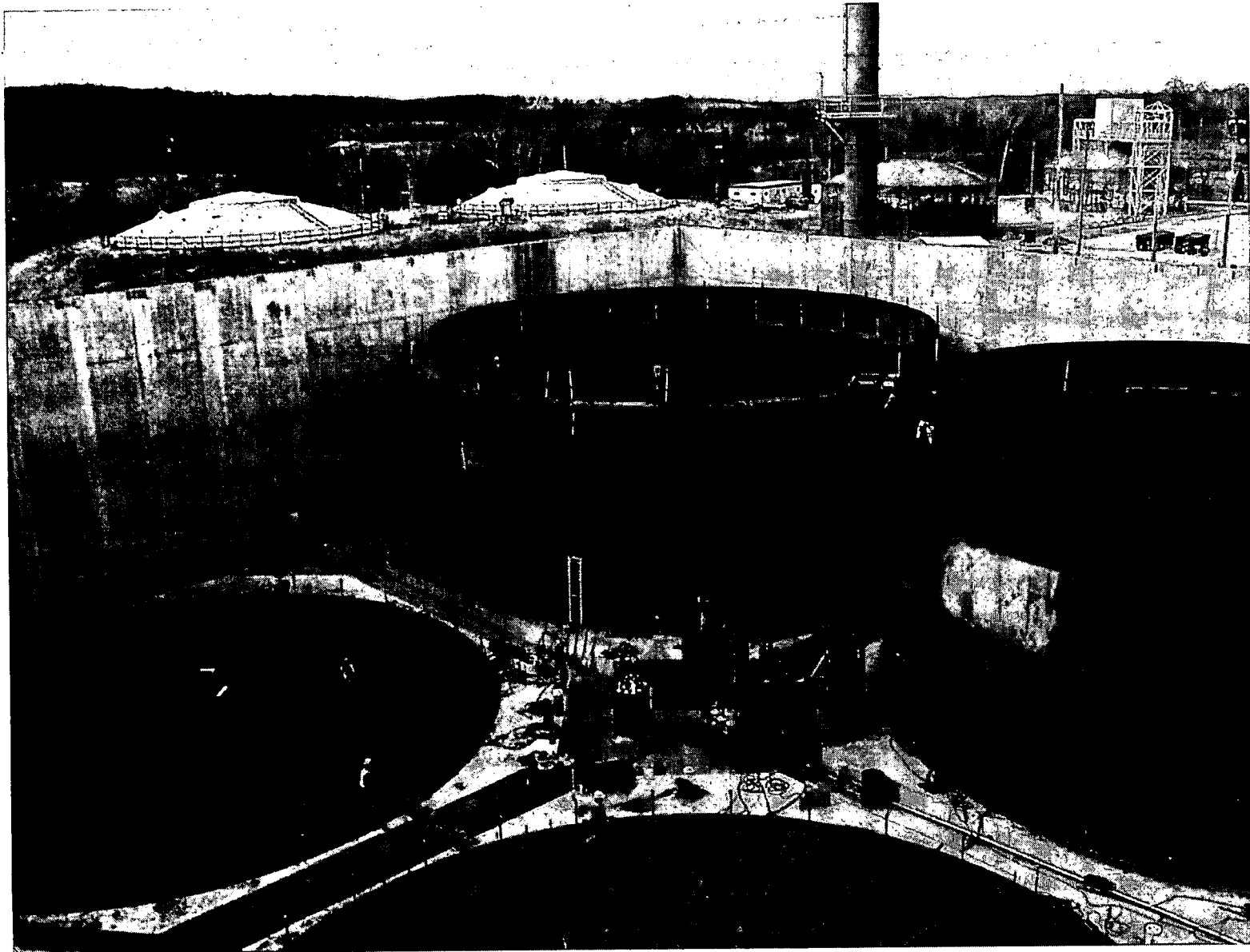
WASTE RETRIEVAL

Waste Retrieval Statistics

- Silos 1 and 2 contain a total of 1.8 million gallons of waste
- Each of the four transfer tanks holds 750,000 gallons; total of 3 million gallons
- Each of the two bridge spans is 175 feet long

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TRANSFER TANK AREA



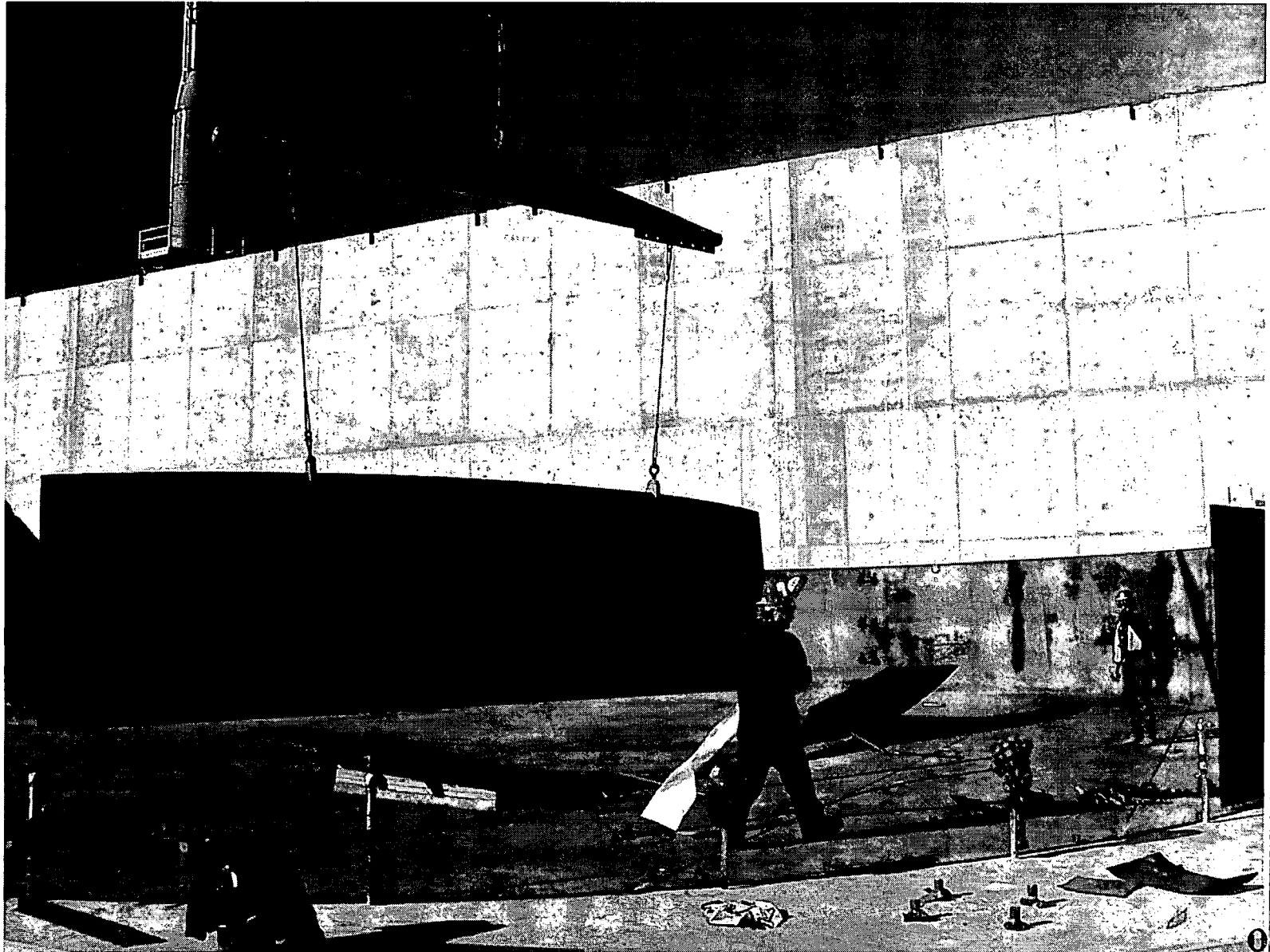
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TRANSFER TANK CONSTRUCTION

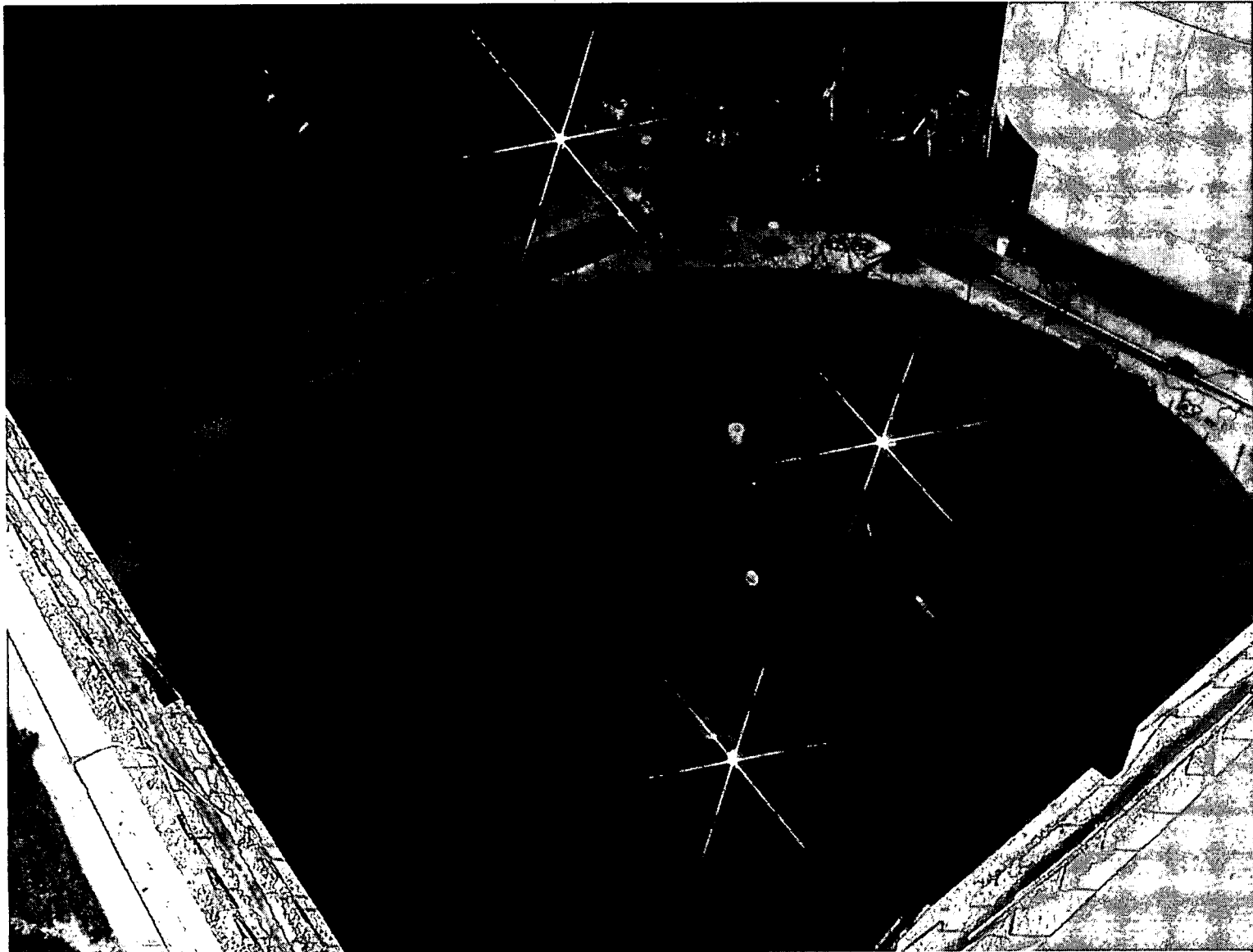


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TRANSFER TANK AREA ROOF ASSEMBLY CONSTRUCTION

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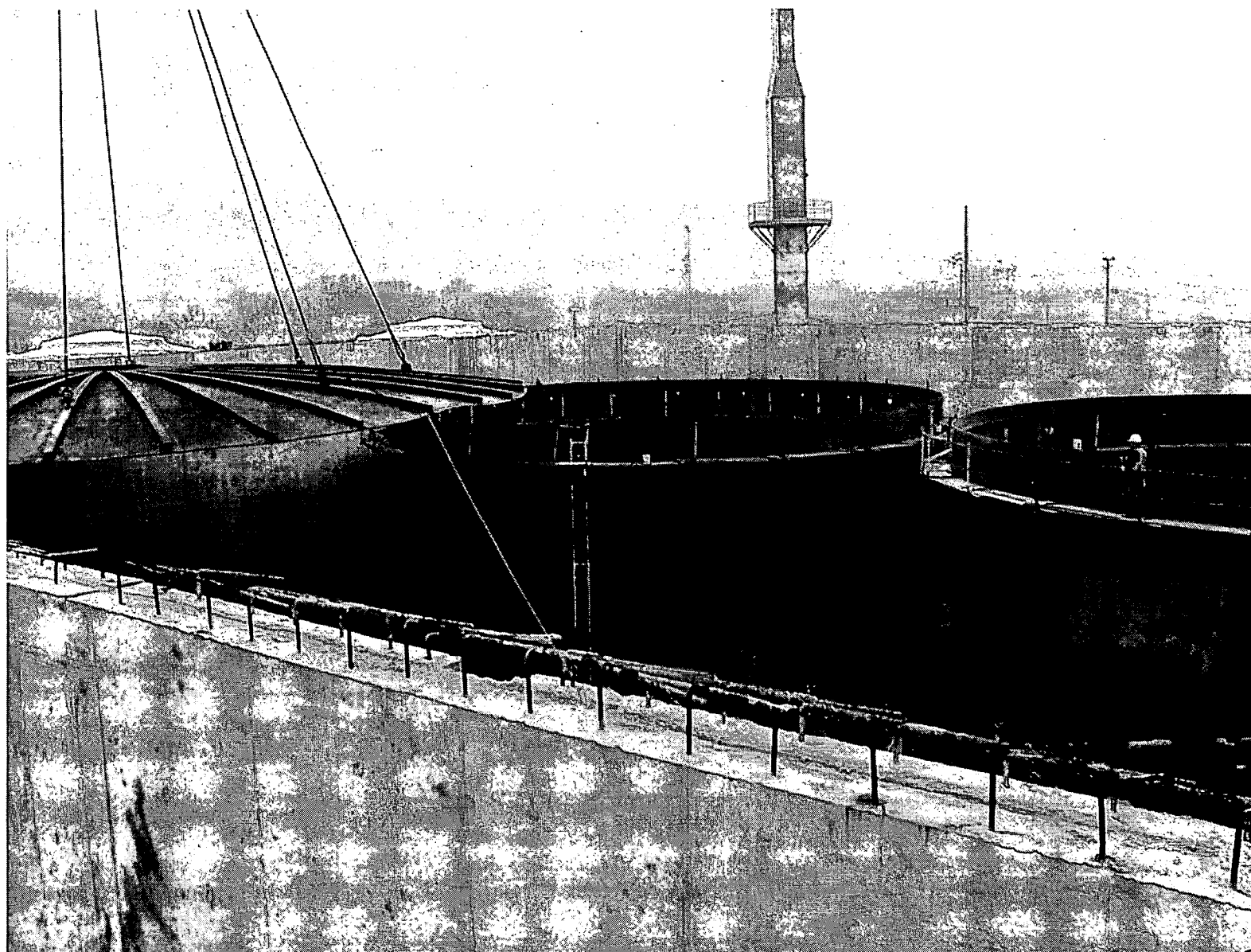
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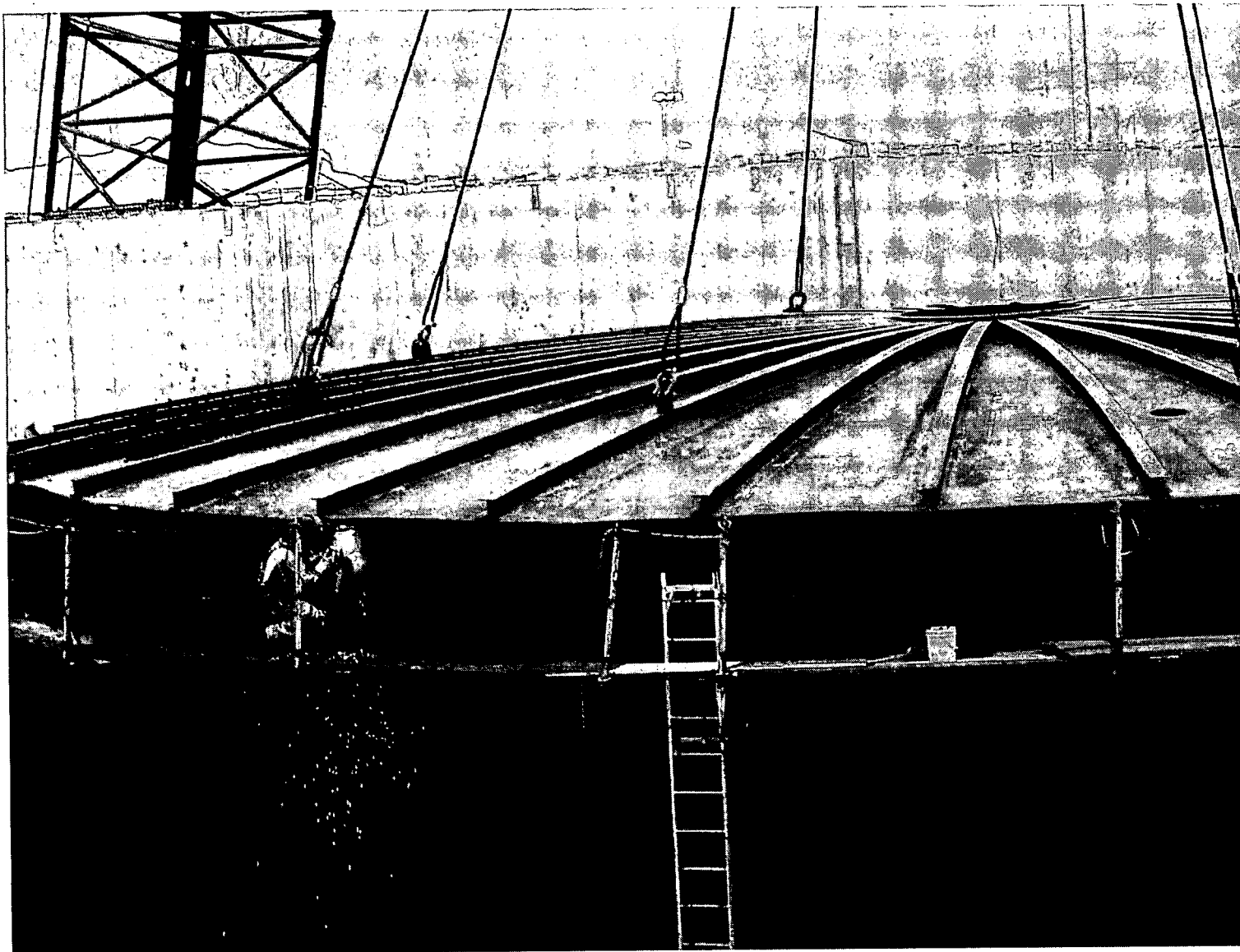
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TRANSFER TANK ROOF ASSEMBLY LIFT



TRANSFER TANK ROOF ASSEMBLY WELDING

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WASTE RETRIEVAL

Waste Retrieval Construction Schedule

- August 2002 Crews to complete construction on Radon Control System
- November 2002 Radon Control System start-up. Crews to complete Silos Waste Retrieval System pipe rack construction
- December 2002 Start Silo 1 and 2 bridge construction
- August 2003 Sluice and slurry system construction

SILOS 1 AND 2

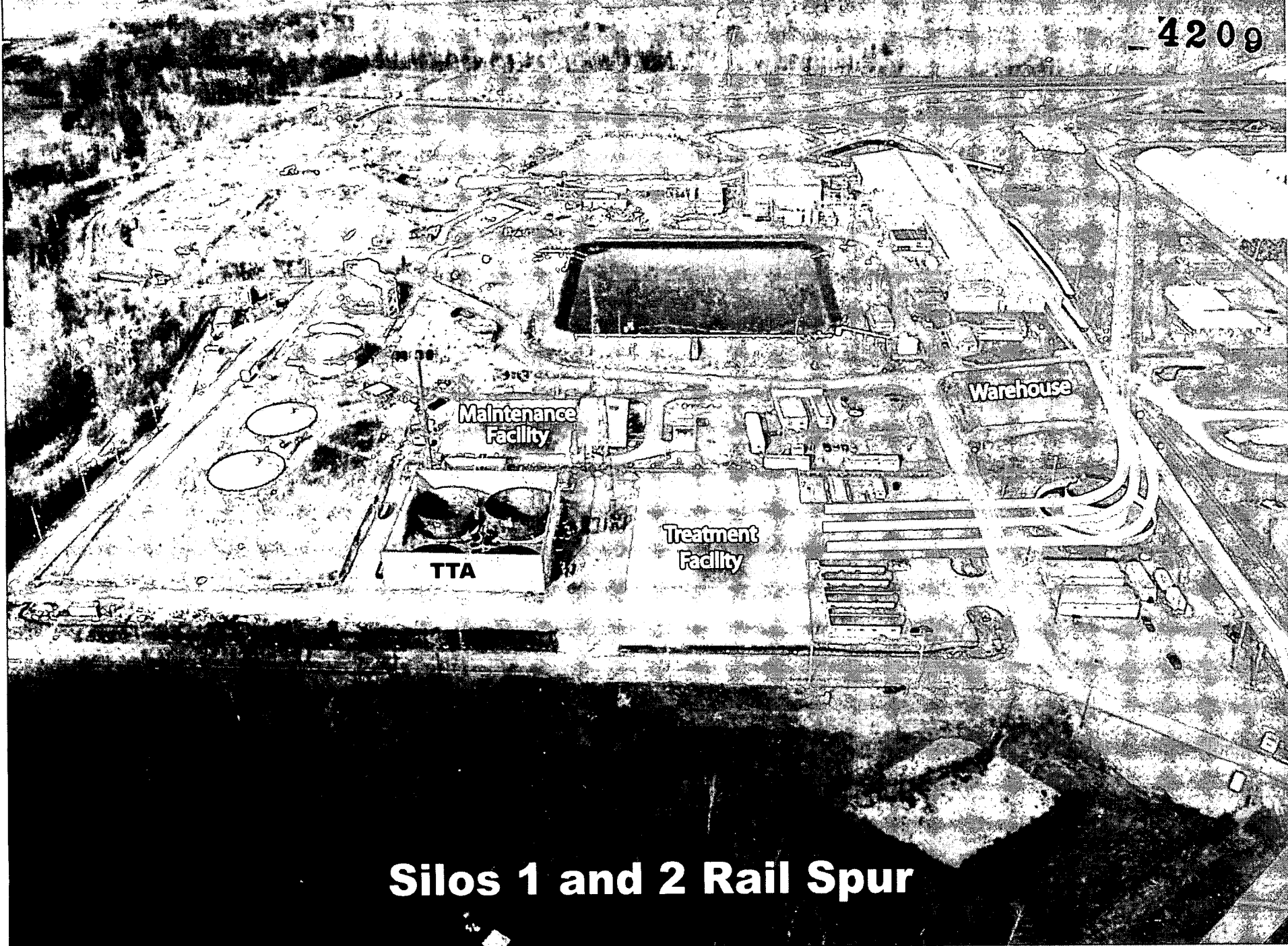
Agenda

- 2006 baseline approach
- Facilities/process design overview
- Engineering/Procurement/Construction approach
- Issues/risks
- Look ahead

SILOS 1 AND 2

2006 Baseline Approach

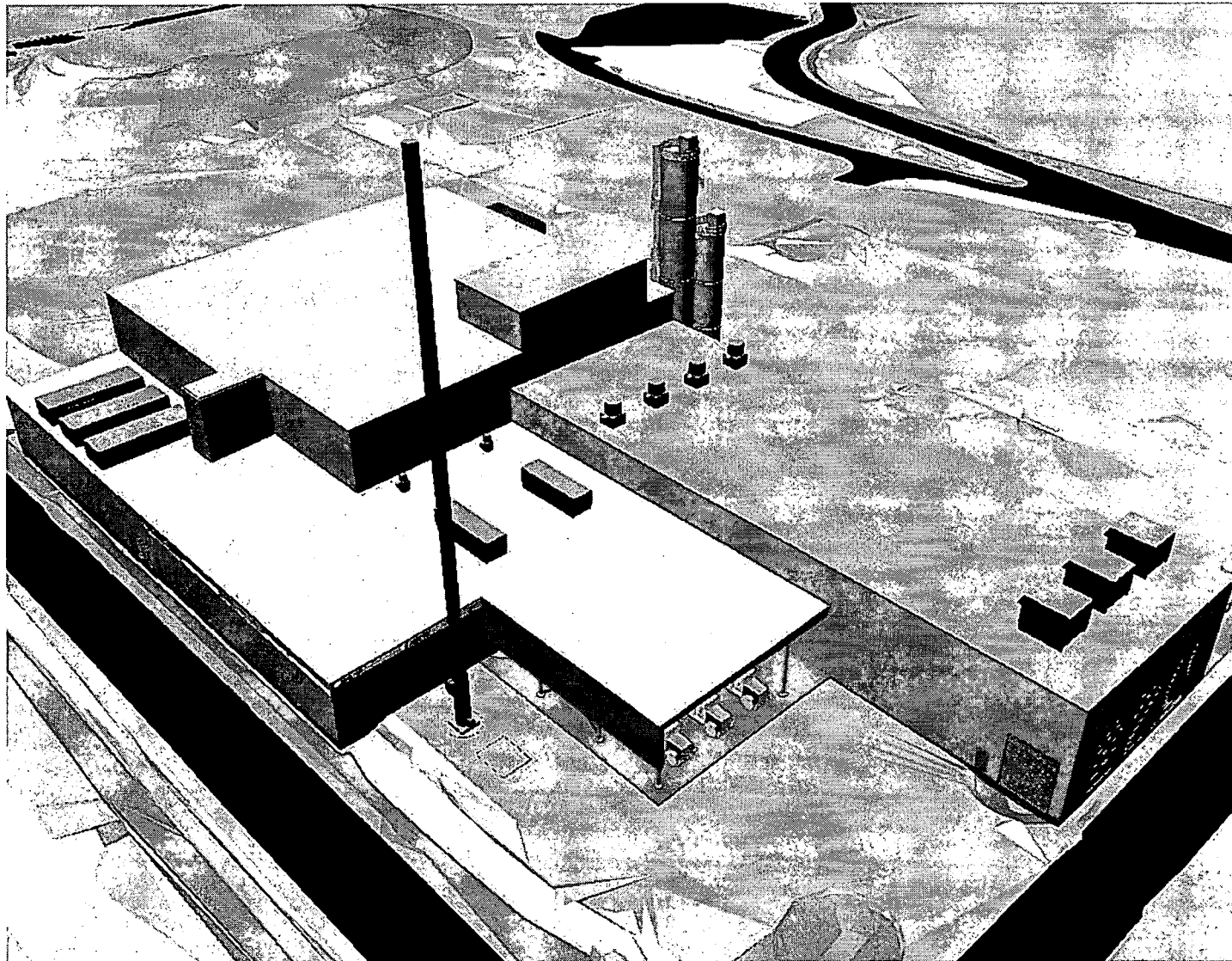
- Dewatering and chemical stabilization/solidification (unchanged)
- Treated grout product placed in sealed steel containers (unchanged)
- Gondola cars ship waste containers by rail to licensed commercial disposal facility
- Treatment operations overlap Waste Retrieval operations by 3-4 months
- Treatment operations begin February 2005 and end February 2006



Silos 1 and 2 Rail Spur

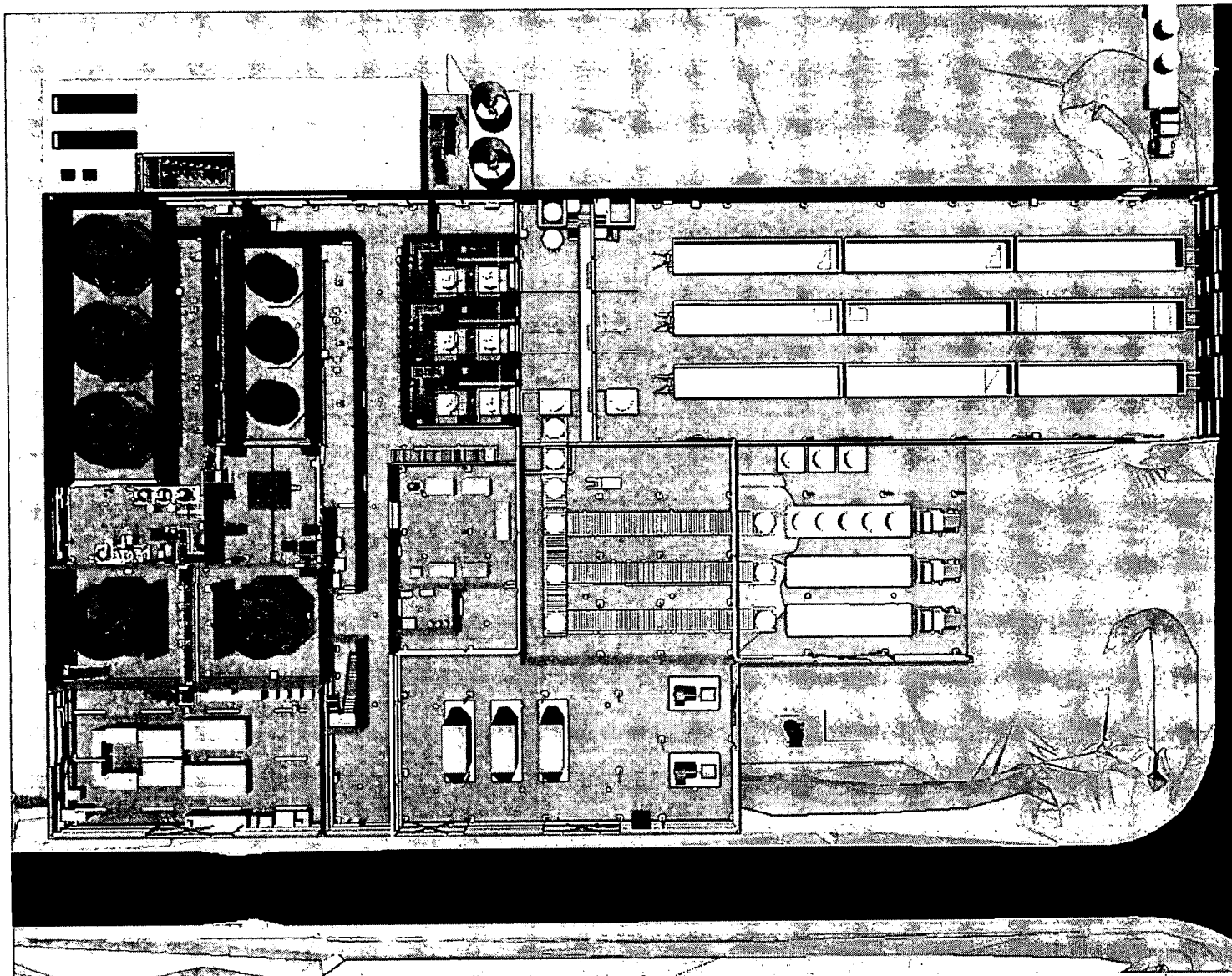
SILOS 1 AND 2 WASTE TREATMENT FACILITY

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SILOS 1 AND 2 WASTE TREATMENT FACILITY

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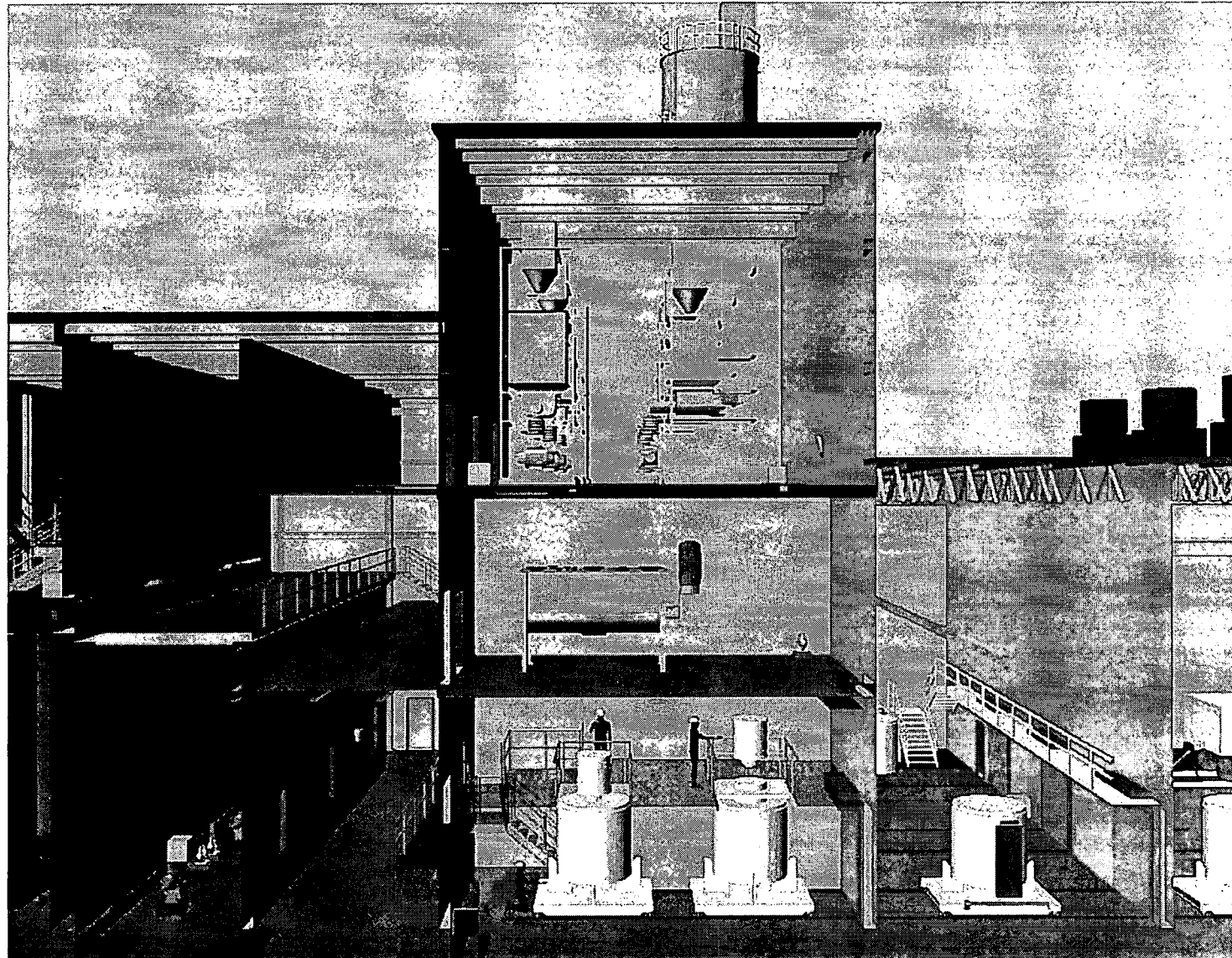


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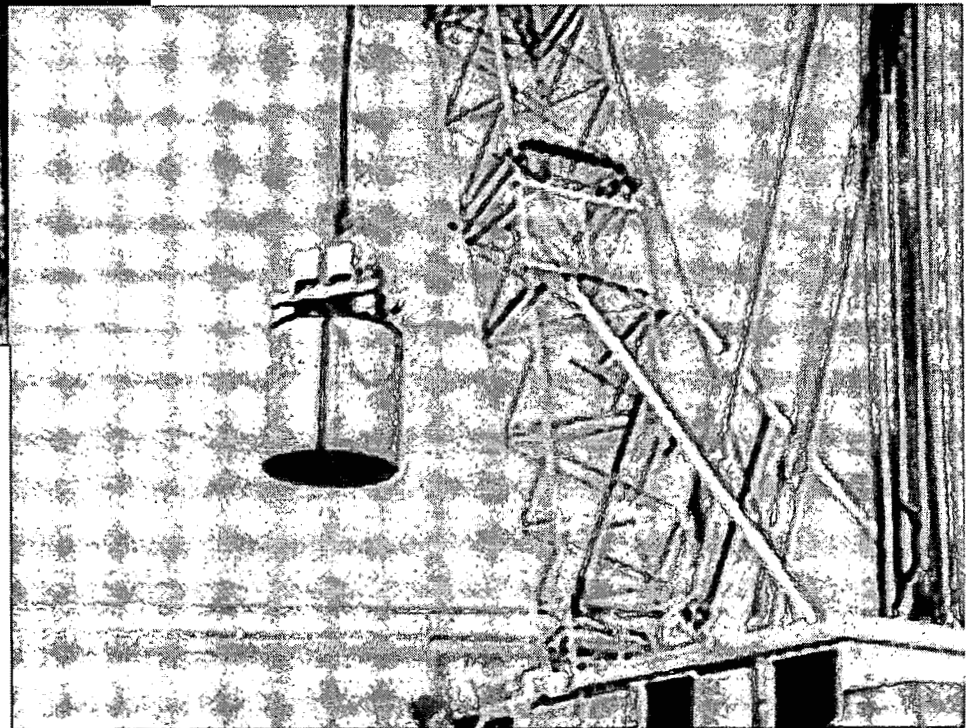
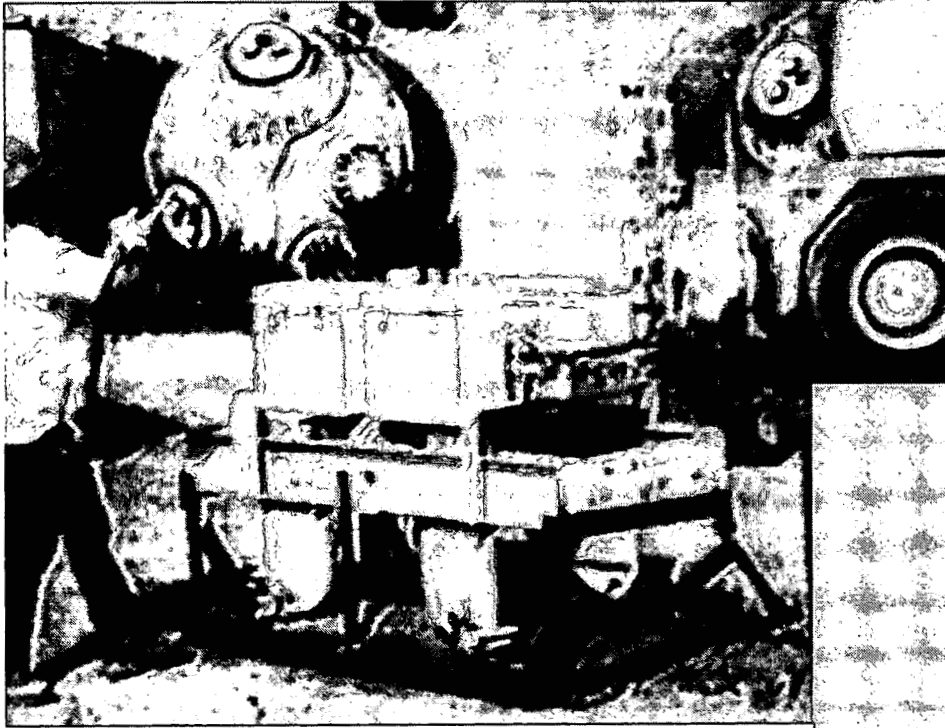
SILOS 1 AND 2 WASTE TREATMENT FACILITY

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GRAPPLER AND GRAPPLER LIFT - 4209



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SILOS 1 AND 2

Engineering/Procurement/Construction Approach

- In April 2002, DOE and CAT will review and comment upon the Preliminary Design Package
- Procurement of major process equipment and systems will begin in April 2002
- Final Design issued as discrete packages to support logical sequencing of construction
- Final Design packages will be complete by February 2003
- Crews will complete construction in June 2004

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SILOS 1 AND 2

Early Procurement Packages

<u>Award</u>	<u>Equipment/System</u>
May 2002	Clarifier system
June 2002	Tank agitators
July 2002	Product mixers
July 2002	Container handling, filling and lidding systems

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SILOS 1 AND 2

Early Construction Packages

<u>Begin</u>	<u>Package</u>
July 2002	Warehouse
September 2002	Rail facilities
October 2002	Treatment facility mat foundation

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SILOS 1 AND 2

Issues and Risks

- ROD amendment and licensing of commercial disposal facilities
- Availability of rail cars and on-site rail facilities
- Procurement and construction prior to total design completion and Remedial Design (RD) package approval

SILOS 1 AND 2

Look Ahead

- April 2002 Preliminary Design Package review
- May 2002 Begin equipment/system procurement
- July 2002 Begin early construction packages
- August 2002 Submit draft RD Package to EPA
(milestone date: December 20, 2002)
- February 2003 Complete final design

SILO 3

Agenda

- Material properties
- Remediation design approach
- Shipping and packaging
- Engineering/procurement/construction (EPC) approach
- Look ahead

SILO 3

Material

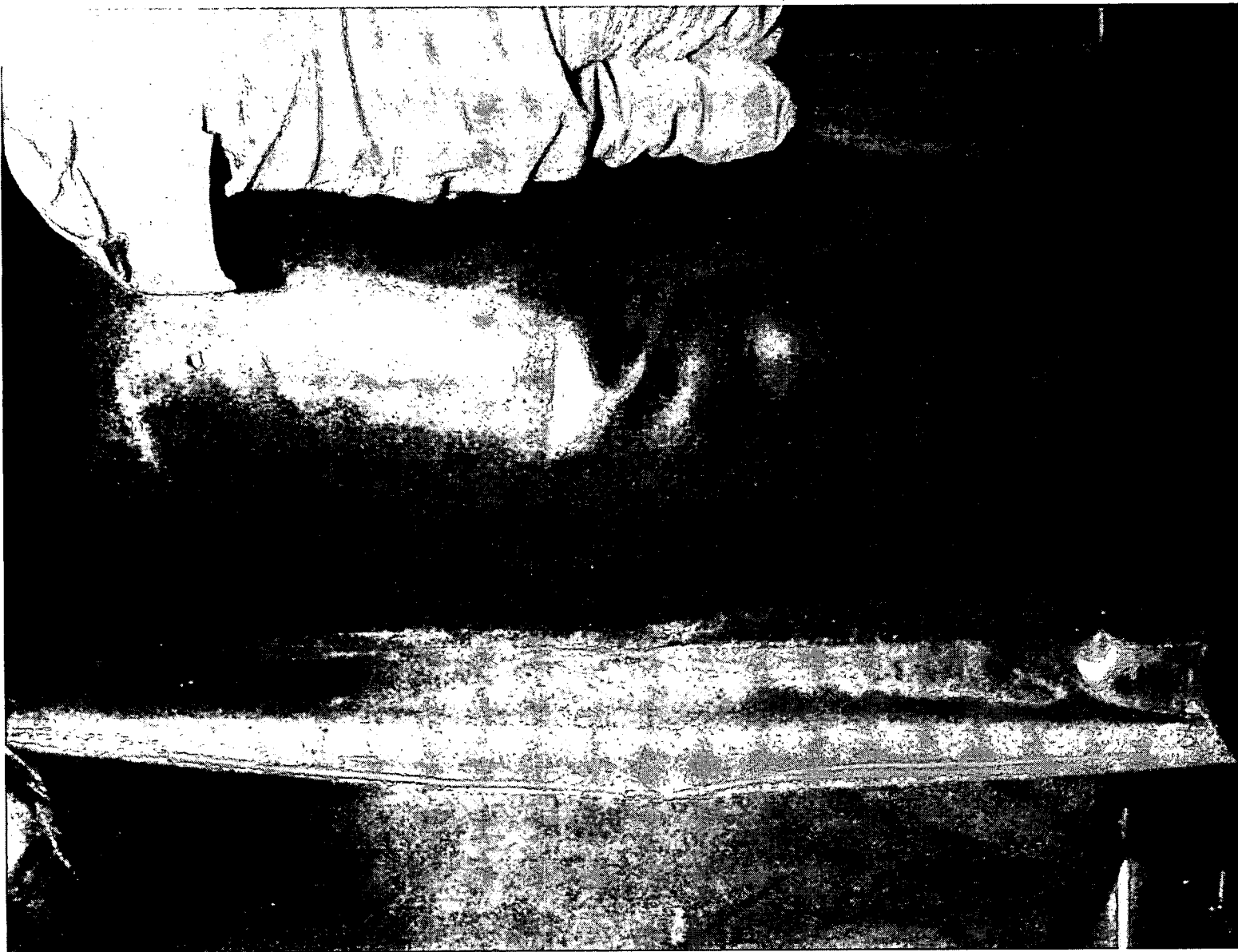
- 5100 cubic yards metal oxide
- DOE classification 11(e)2 byproduct material
- Stored in 80-foot diameter silo which is a little over 26 feet high
- Calcined, incinerated, non-explosive material containing no organics
- Brown powder, rust-like because of metals, behaves like flyash or salts

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SILO 3 WASTE MATERIAL

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SILO 3

Material Radiological Concerns

- Radium 226: gives off radon
- Thorium 230: ranges from 26,000 pCi/g (picocuries per gram) to 76,000 pCi/g
- Alpha emitter: particles can be stopped by paper and Personal Protective Equipment
- Inhalation hazard

SILO 3

Remediation Design

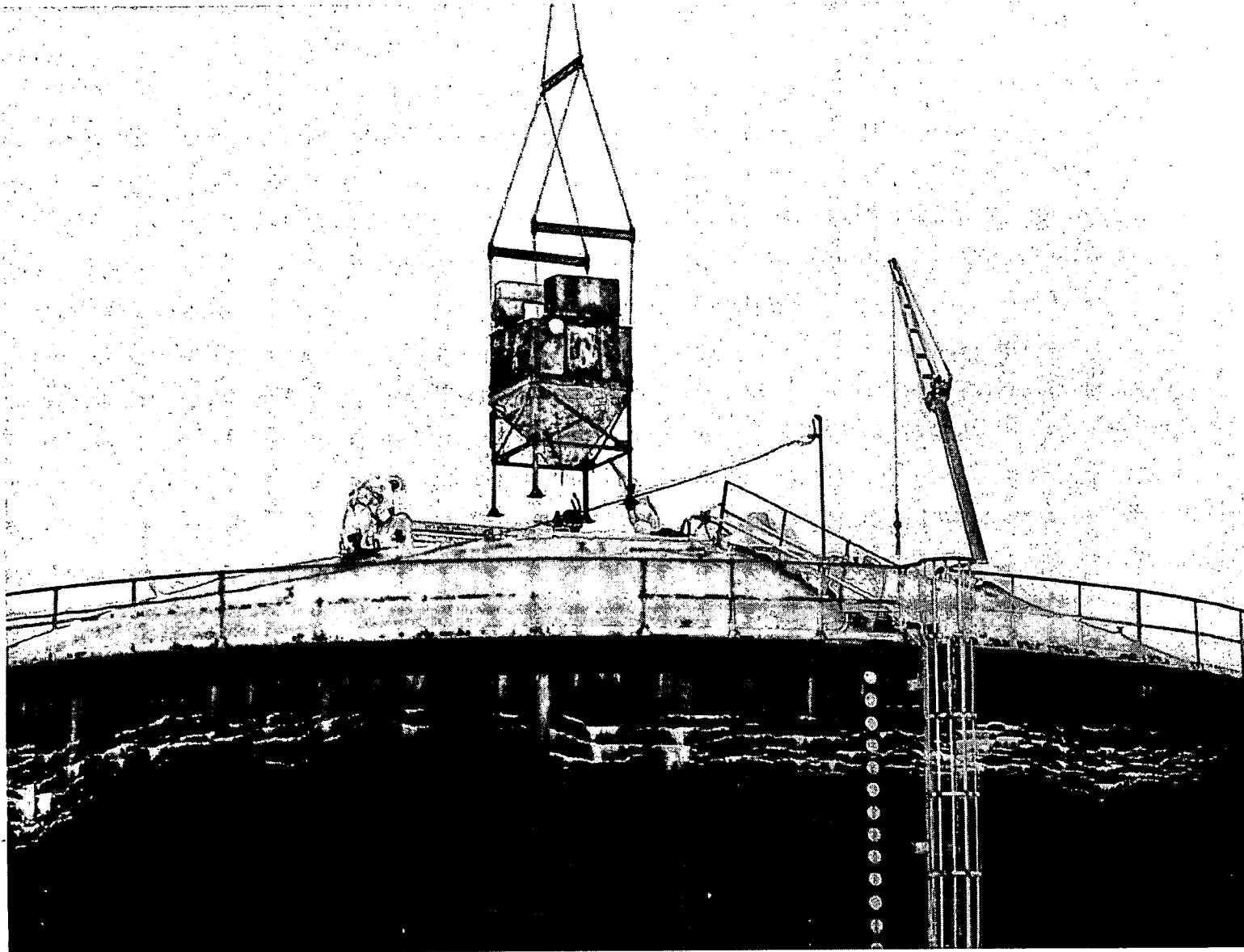
- No treatment
- Removal, packaging and shipping
- Two retrieval strategies: pneumatic (vacuuming) and mechanical (excavation)

SILO 3

Retrieval Strategies: Pneumatic (Vacuuming)

- In the 1950s, workers pneumatically conveyed material into Silo 3
- Dome access evaluation
- Containment over Silo 3
- Access platforms over manways

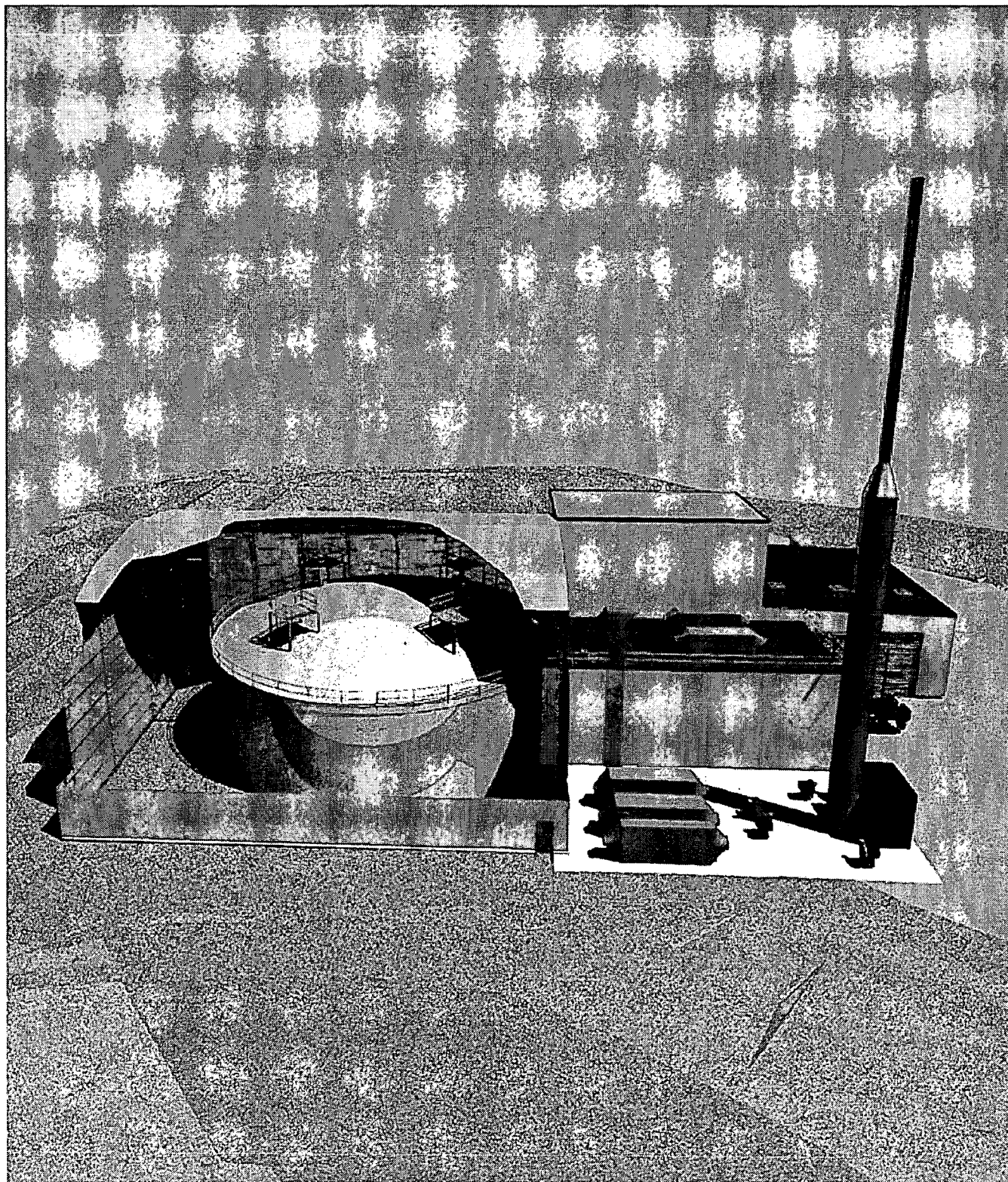
SILO 3 DUST COLLECTOR REMOVAL ⁴²⁰⁰₄₂₀₉



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SILO 3 REMEDIATION FACILITIES



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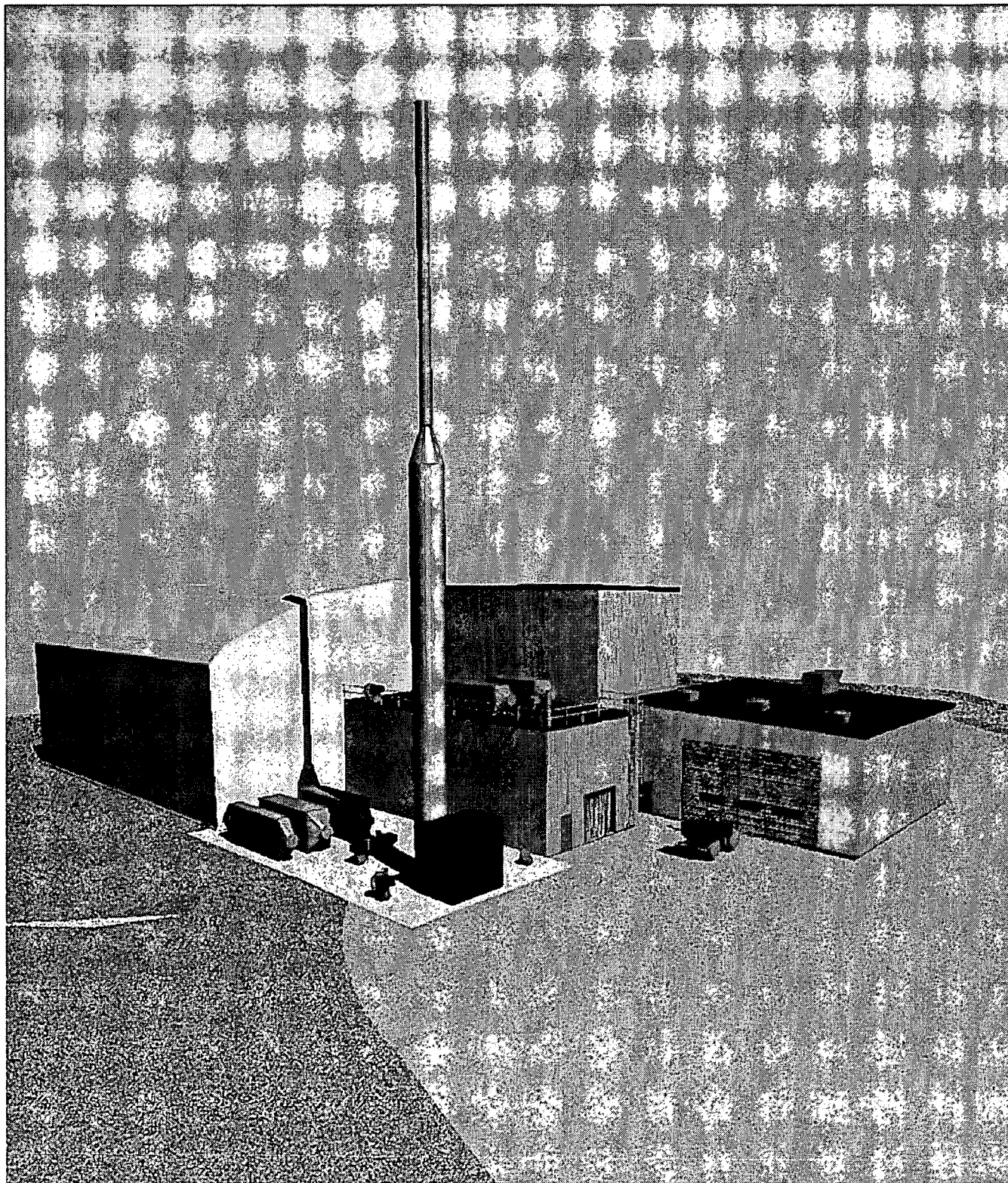
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SILO 3

Retrieval Strategies: Mechanical (Excavation)

- Engineers recently completed analysis on cutting opening
- Crews will install reinforcing material around the silo
- Plans include a separate excavator room for retrieval

SILO 3 REMEDIATION FACILITIES

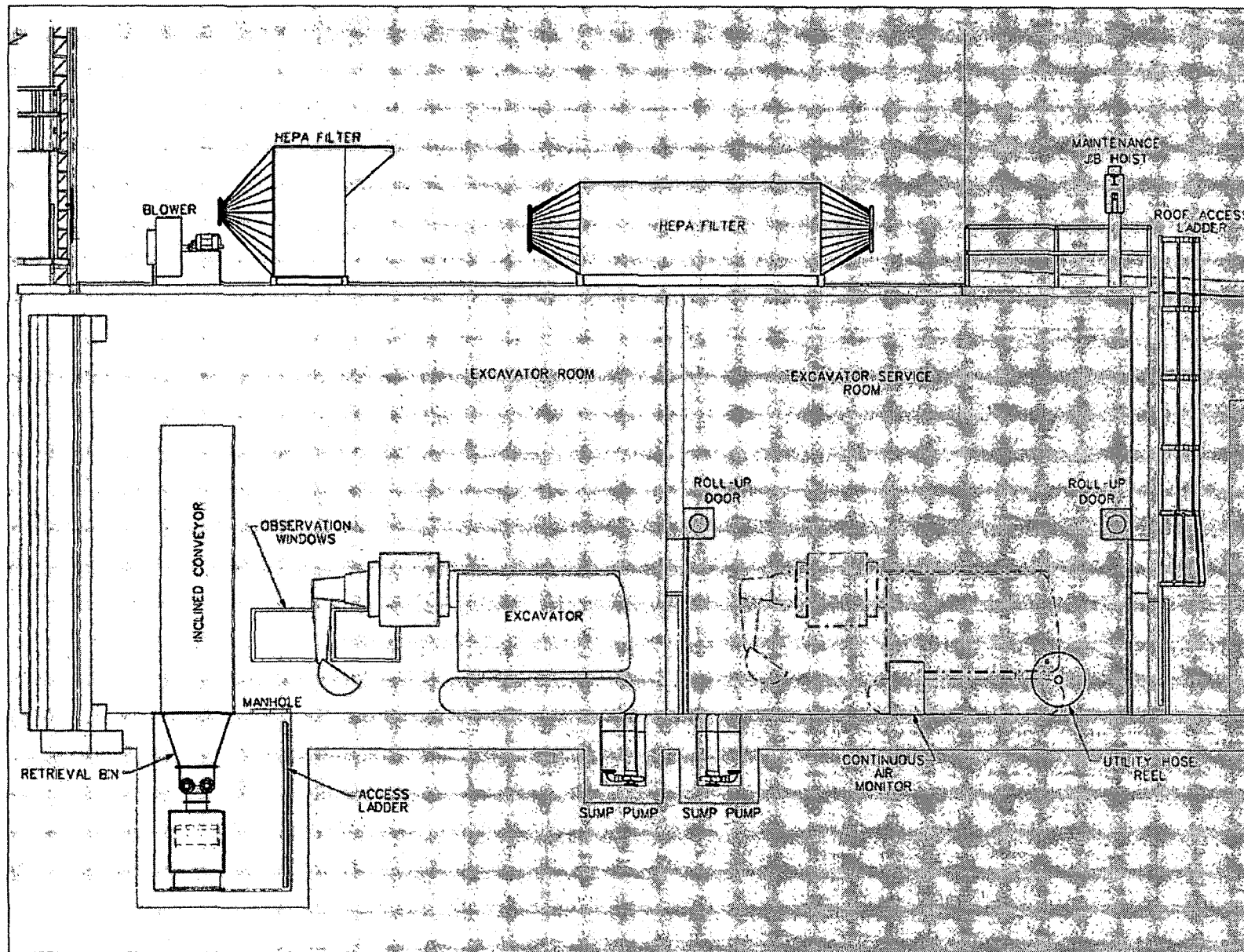


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SILO 3 EXCAVATOR ROOM



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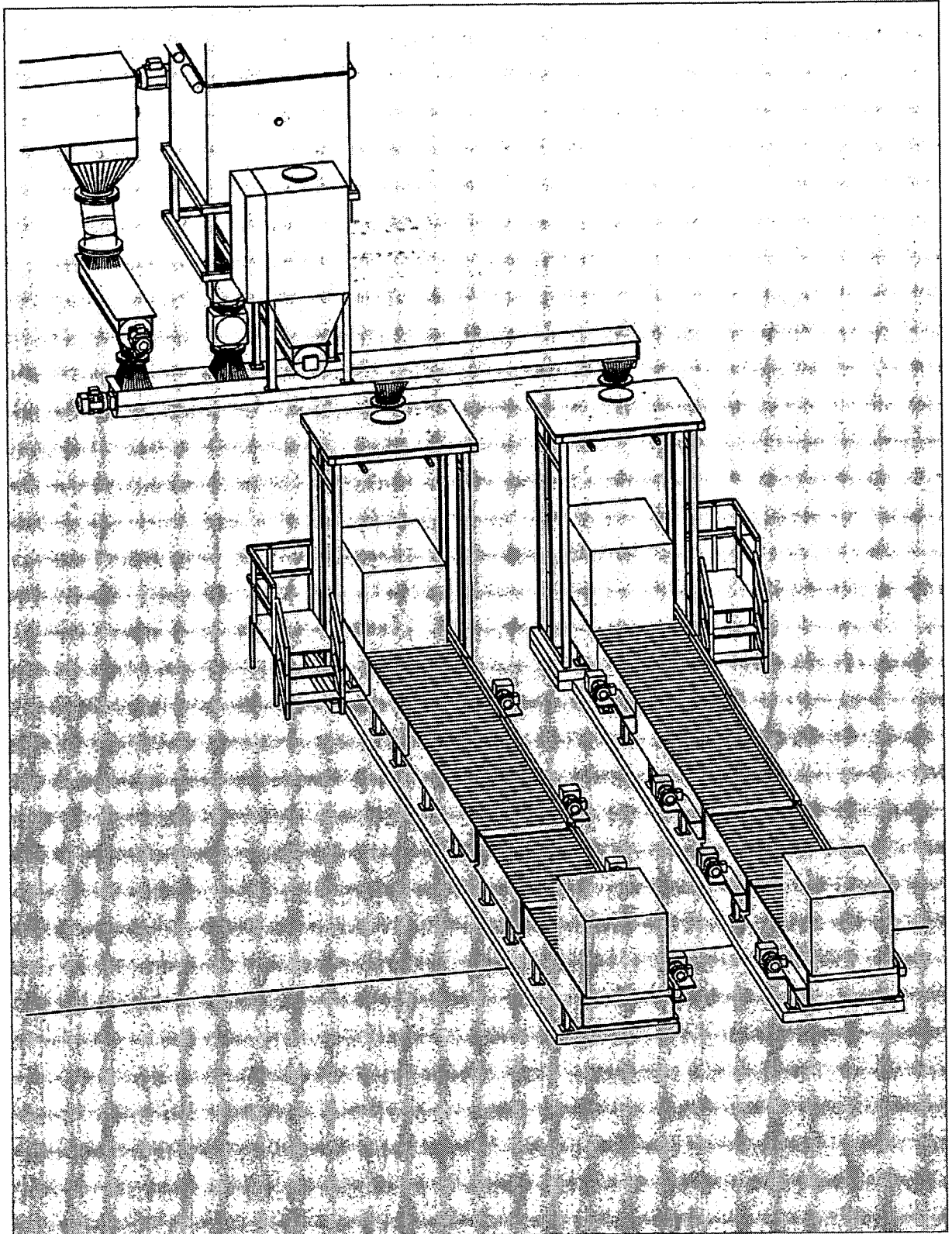
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SILO 3

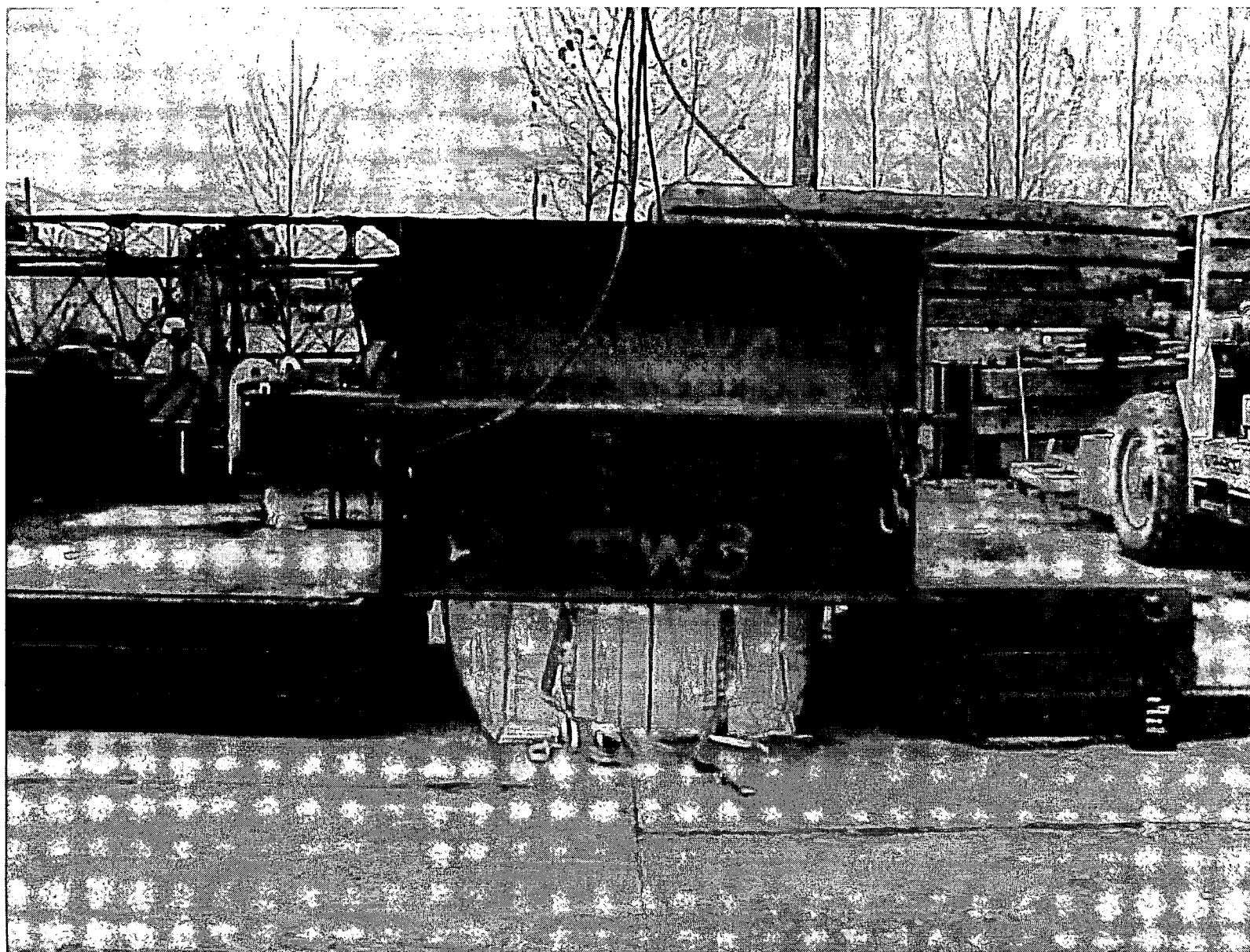
Packaging

- Packaging area will have closed system
- IP-2 package
- Package meets requirements of Department of Transportation (DOT) standard, 49 CFR 173.411
- Inner liner for worker protection and contamination control
- Outer shipping container

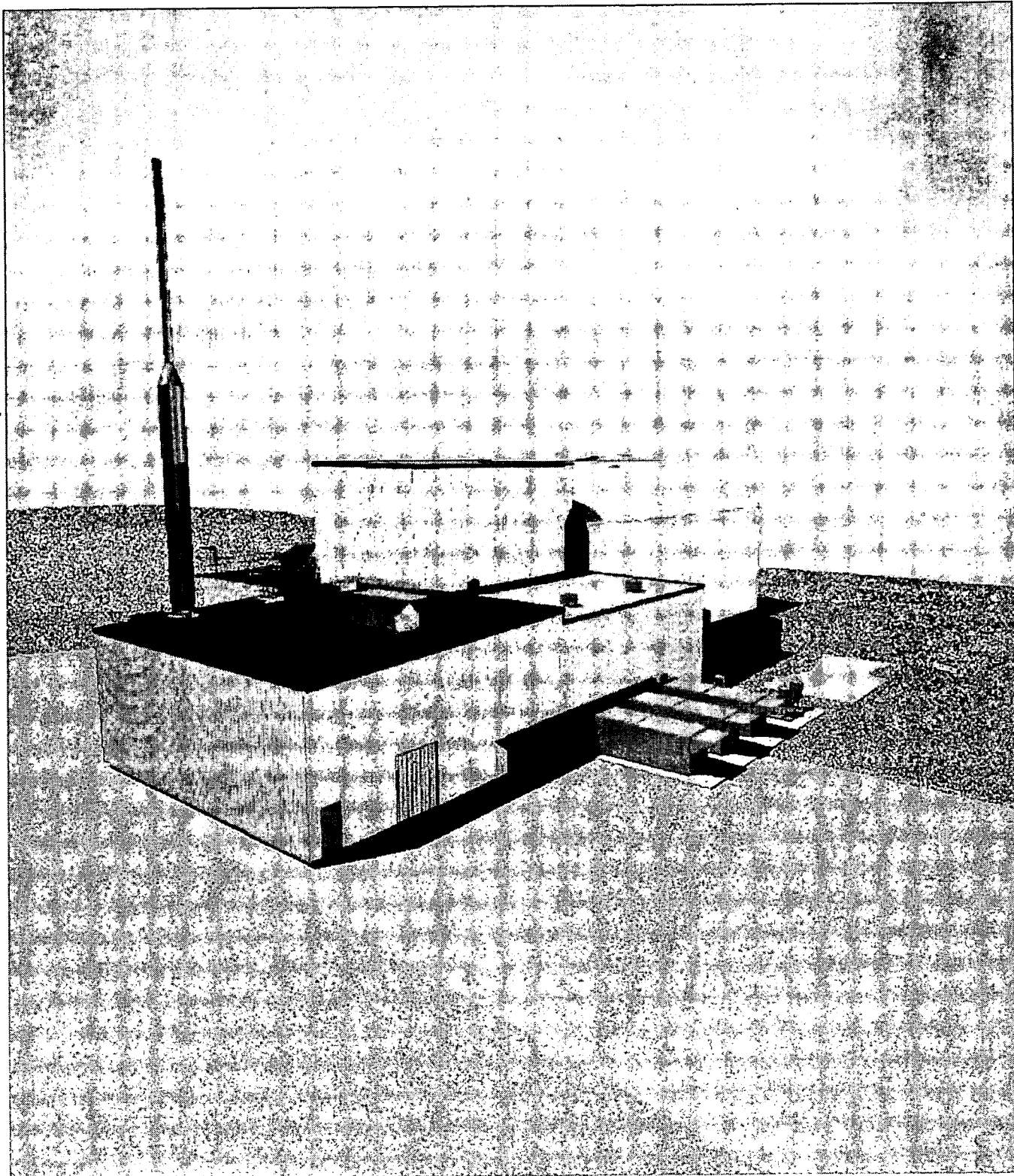
SILO 3 PACKAGING AREA



SOFT-SIDED PACKAGE TESTING



SILO 3 REMEDIATION FACILITIES



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SILO 3

Shipping

- Ship material offsite without treatment
- Meets DOT risk evaluation criteria (Rad-Tran analysis)
- Evaluating options to reduce dispersibility
- Requirements for thorium DOT classification:

WPRAP	LSA-I	5400 pCi/g
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Silo3	LSA-II	76,000 pCi/g
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- Upper limit of LSA-II is 541,000 pCi/g
- IP-2 packaging requirement
- Conducting radon emanation testing

SILO 3

Design Packages

April 2002	Silo reinforcing
April 2002	Site preparation
May 2002	Civil/concrete
June 2002	Mechanical
July 2002	Electrical and instrumentation

SILO 3

Early Construction Activities

May 2002

Start field work

December 2002

Complete field work

SILO 3

Look Ahead

- Submit Remedial Design package to EPA
- ROD amendment: no treatment
- Disposal contract
- Packaging and Shipping Request for Proposal (RFP)

	SILOS 1 & 2	SILO 3
HAZARDS	Radon gas, radium, gamma does	Thorium 230 dust
RETRIEVAL	Sluice material to AWR Transfer Tanks	Vacuum loose dry material and excavate compacted material
TRANSFER	To treatment facility	Directly to packaging
TREAT	Chemically treat RCRA metals	No on-site treatment
STABILIZE	Free moisture and material mixture	No moisture requiring stabilization
DURATION OF OPERATIONS	February 2005 - February 2006	March 2003 - September 2003
PACKAGE	Sealed cylindrical metal canisters	Sealed plastic liner inside IP2 certified lift liner bag inside cargo container
SHIP	Seven canisters to each shielded gondola car; dispatch as unit trains	Four cargo containers to one flatbed railcar; three cars attached to each Waste Pit unit train; total of 38 cars
CURRENT MANDATES	Record of Decision (ROD) calls for chemical stabilization and disposal at Nevada Test Site (NTS)	Explanation of Significant Differences (ESD) calls for chemical stabilization or encapsulation to meet RCRA limits and disposal facility Waste Acceptance Criteria (WAC). Disposal at either NTS or permitted offsite facility
ROD AMENDMENTS	Proposed amendment would allow alternate disposal and treatment as required by permitted offsite facility's WAC	Proposed amendment would allow disposal as required by permitted offsite facility's WAC